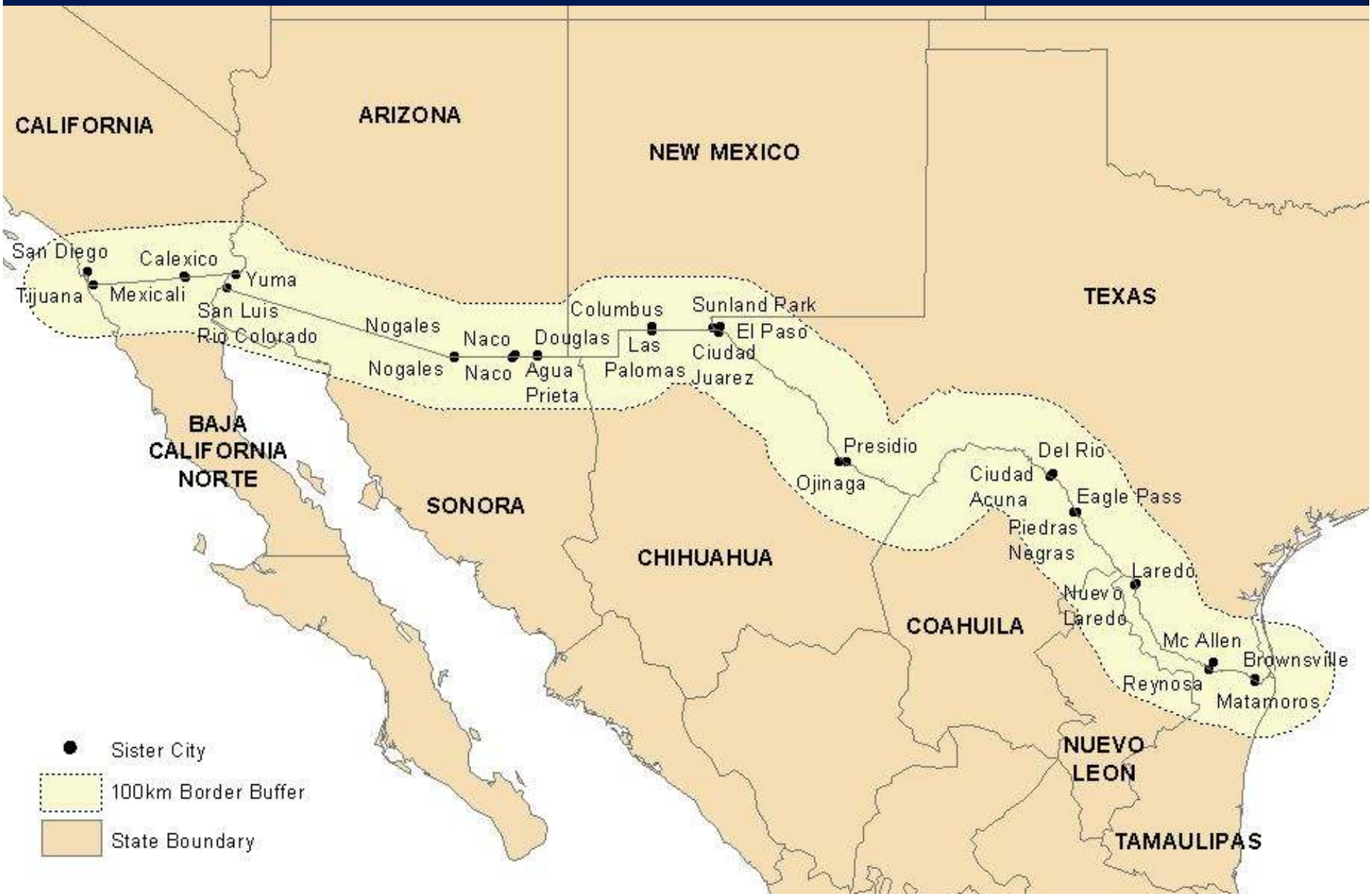
# Chemical Emergency Preparedness and Emergency Response along the ARIZONA - SONORA Border

Arizona State University
College of Technology and Applied Sciences
California Arizona Consortium

**National Institute of Environmental Health Sciences**
**WETP Conference**
**Washington D.C., April 22-23, 2004**

# Southwest Border



# US - Mexico Border

- Extends 2000 miles
- Border region extends 62.5 miles on each side of the border
- 4 states in the US
- 6 states in Mexico
- 14 Sister Cities
- 26 US federally recognized Native American tribes along international border
- Population in the border region –approx. 6.3 million in the US and 5.5 million in Mexico

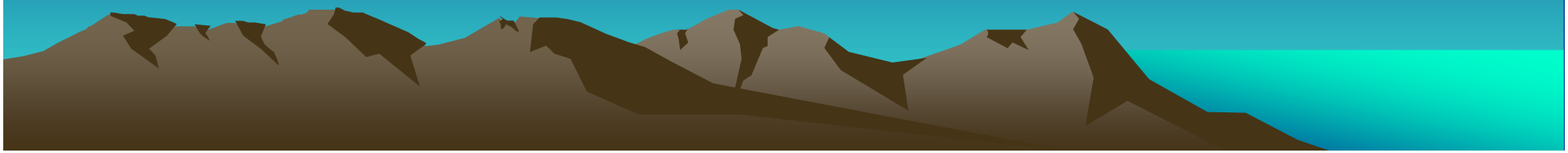
# Border Sister Cities

- San Diego – Tijuana
- Calexico – Mexicali
- Yuma – San Luis
- Nogales – Nogales
- Naco – Naco
- Douglas – Agua Prieta
- Columbus – Puerto Palomas
- El Paso – Ciudad Juarez
- Presido – Ojinaga
- Del Rio – Ciudad Acuña
- Eagle Pass – Piedras Negras
- Laredo – Nuevo Laredo
- McAllen – Reynosa
- Brownsville - Matamoros

# La Paz Agreement

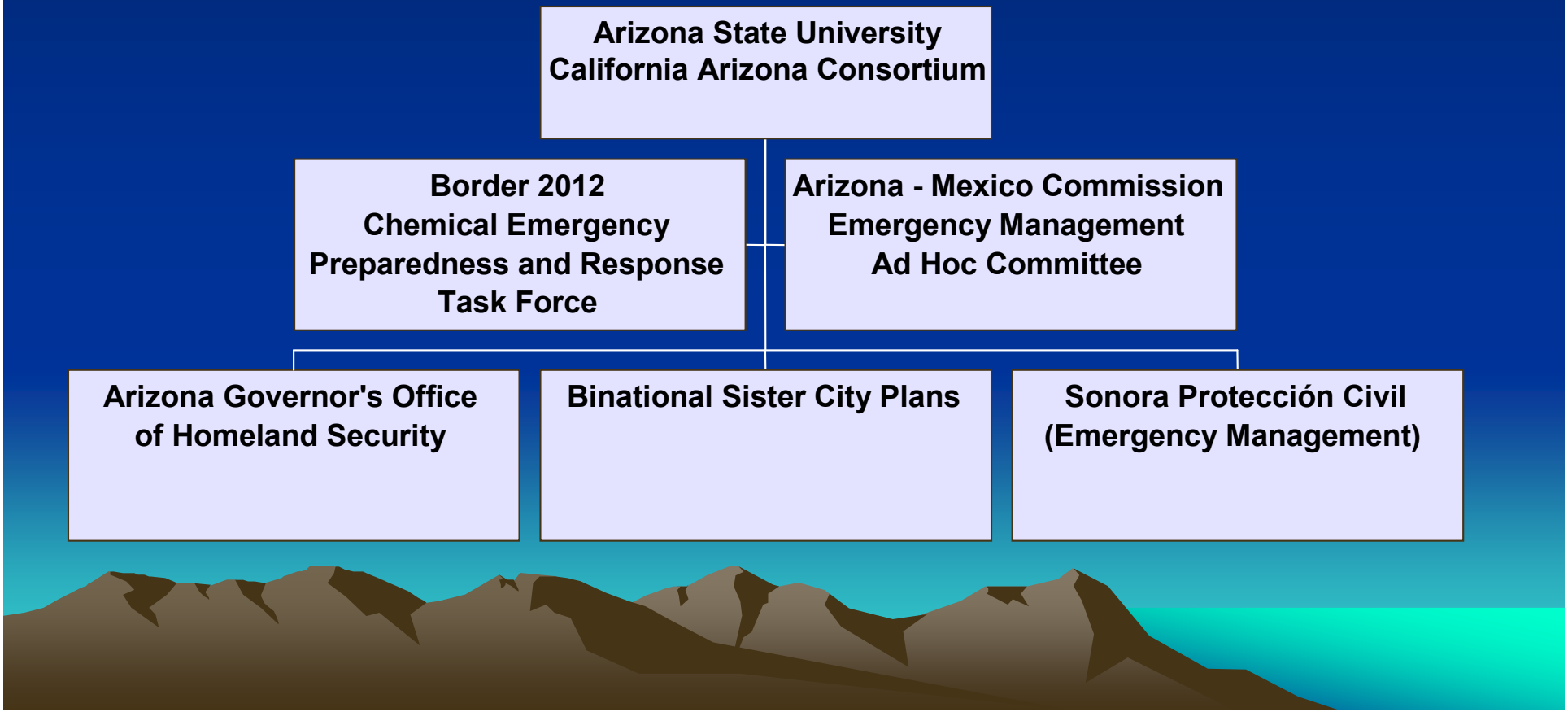
- La Paz, Baja California January 29, 1983
- Signed by
  - President Miguel de la Madrid
  - President Ronald Regan
- Article 1

> …agree to cooperate in the field of **environmental protection** in the border area on the basis of equality, reciprocity and mutual benefit. The objectives of the present Agreement are to establish the basis for cooperation between the Parties for the **protection, improvement and conservation of the environment** and the problems which affect it, as well as to agree on necessary measures to prevent and control pollution in the border area, and to provide **the framework for development of a system of notification for emergency situations**…



# Arizona State University California Arizona Consortium

## Binational Emergency Response Training



# Southwest Center for Environmental Research and Policy (SCERP)

- US Congress established SCERP in October 1990 to "initiate a Comprehensive Analysis of Possible Solutions to Environmental Problems in US/Mexican border Region"
- US Congress funded grants to the Universities for the Environmental Research
- Border 21 1996

# SCERP

| US Universities | Mexican Universities |
|---|---|
| Arizona State University (ASU) | El Colegio de la Frontera (COLEF) |
| New Mexico State University (NMSU) | Instituto Technológico de Ciudad Juarez (ITCJ) |
| San Diego State University (SDSU) | Instituto Technológico y de Estudios Superiores de Monterey (ITESM) |
| The University of Texas – El Paso (UTEP) | Universidad de Autónoma de Baja California (UABC) |
| The University of Utah (UU) | Universidad de Autónoma de Ciudad Juarez (UACJ) |

# ASU /CAC Outreach to Mexico: SCERP Grants

- 40-Hour Hazardous Waste Worker Operations and Emergency Response Training (HazWOpER)
- 16-Hour Hazardous Materials Transportation Training
- Pollution Prevention – Waste Solvent Reduction
- 24 Hr. First Responder Emergency Response Training

# Course Curriculum Utilized NIEHS WETP Training Modules

- 40 Hr. Hazwoper
- 24 Hr. Emergency Response
- 16 Hr. Hazardous Materials Transportation

# 40-Hr. Hazardous Waste Worker Operations Emergency Response Training (HazWOpER)

| Location | Maquilladora Facility |
|---|---|
| Mexicali, Baja CA | Emerson Electric |
| San Luis Rio Colorado, Sonora | DAEWOO Electronics |
| Nogales, Sonora | Grupo Chamberlin |

# 16-Hr. Hazardous Materials / Waste Transportation

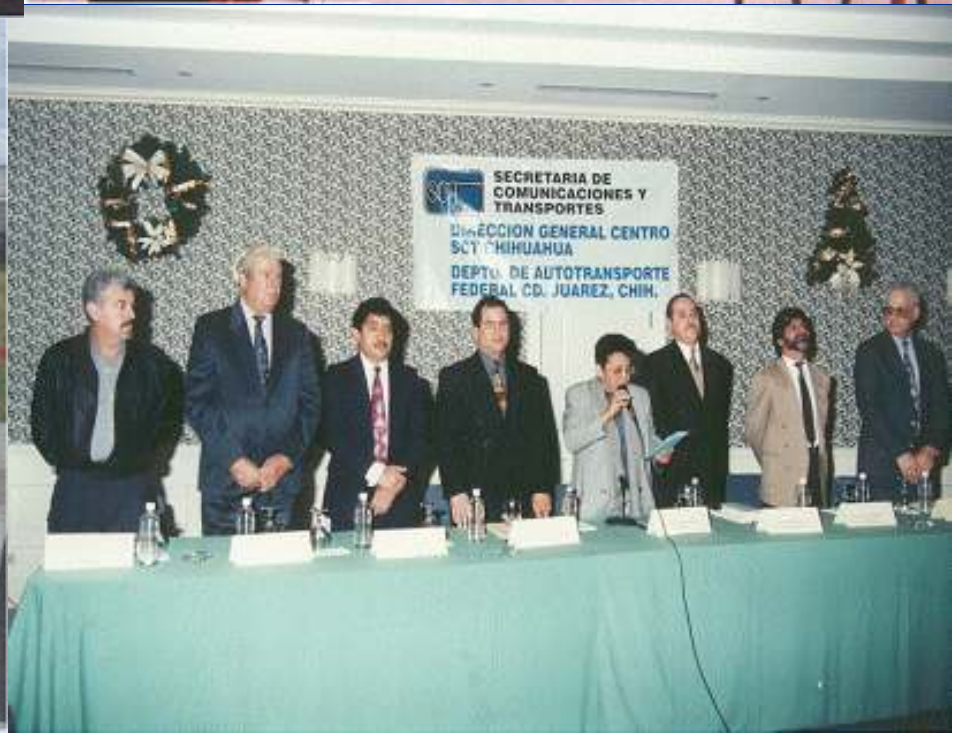
**Location**

Nogales, Sonora

Ciudad Juarez, Chihuahua

Mexicali, Baja California

Nuevo Laredo, Tamaulipas


SECRETARIA DE
COMUNICACIONES Y
TRANSPORTES
DIRECCION GENERAL CENTRO
SCT CHIHUAHUA
DEPTO. DE AUTOTRANSPORTE
FEDERAL CD. JUAREZ, CHIH.

# Pollution Prevention Studies

Nogales, Sonora

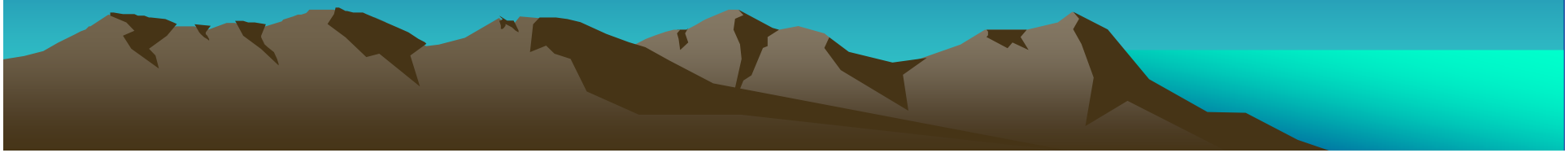
Agua Prieta, Sonora

Mexicali, Baja Clifornia

# Border 2012

- April 4, 2003, Tijuana, Baja California, Mexico
- U.S. EPA and Mexico SEMARNAT (U.S. EPA Counterpart),
- 10 border states (4 U.S. and 6 Mexico)
- 26 US Tribes

Border 2012: U.S.- Mexico Environmental Program: mark the beginning of the 10-year joint effort, by these Federal agencies, the states, municipalities, non-governmental organizations, educational institutions and border residents to work together to improve the public health and environment on the U.S.-Mexico Border



# Border 2012 Goals

- #1 Reduce Water Contamination
- #2 Reduce Air Pollution
- #3 Reduce Land Contamination
- #4 Improve Environmental Health
- **#5 Reduce Exposure to Chemicals as a Result of Accidental Chemical Releases and/or Acts of Terrorism**
- #6 Improve Environmental Performance through compliance, Enforcement, Pollution Prevention, and Promotion of Environmental Stewardship

# Goal #5: Objectives

1. 2004 – Mechanism for Identification of Risks on Both Sides of the Border
2. 2008 – Joint Contingency Plans Completed for all 14 Pairs of Sister Cities with Binational Committees for Chemical Emergency Prevention
3. 2012 – 50% of Sister City Joint Contingency Plans Completed to Include Plans for Counter-Terrorism

# Binational Joint Sister City Plan Ambos Nogales

- March 1, 2001, Nogales, Arizona
- Signed by
  - ✓ Municipal President Lic. Cota Montoya
  - ✓ Mayor Rios
- Goal

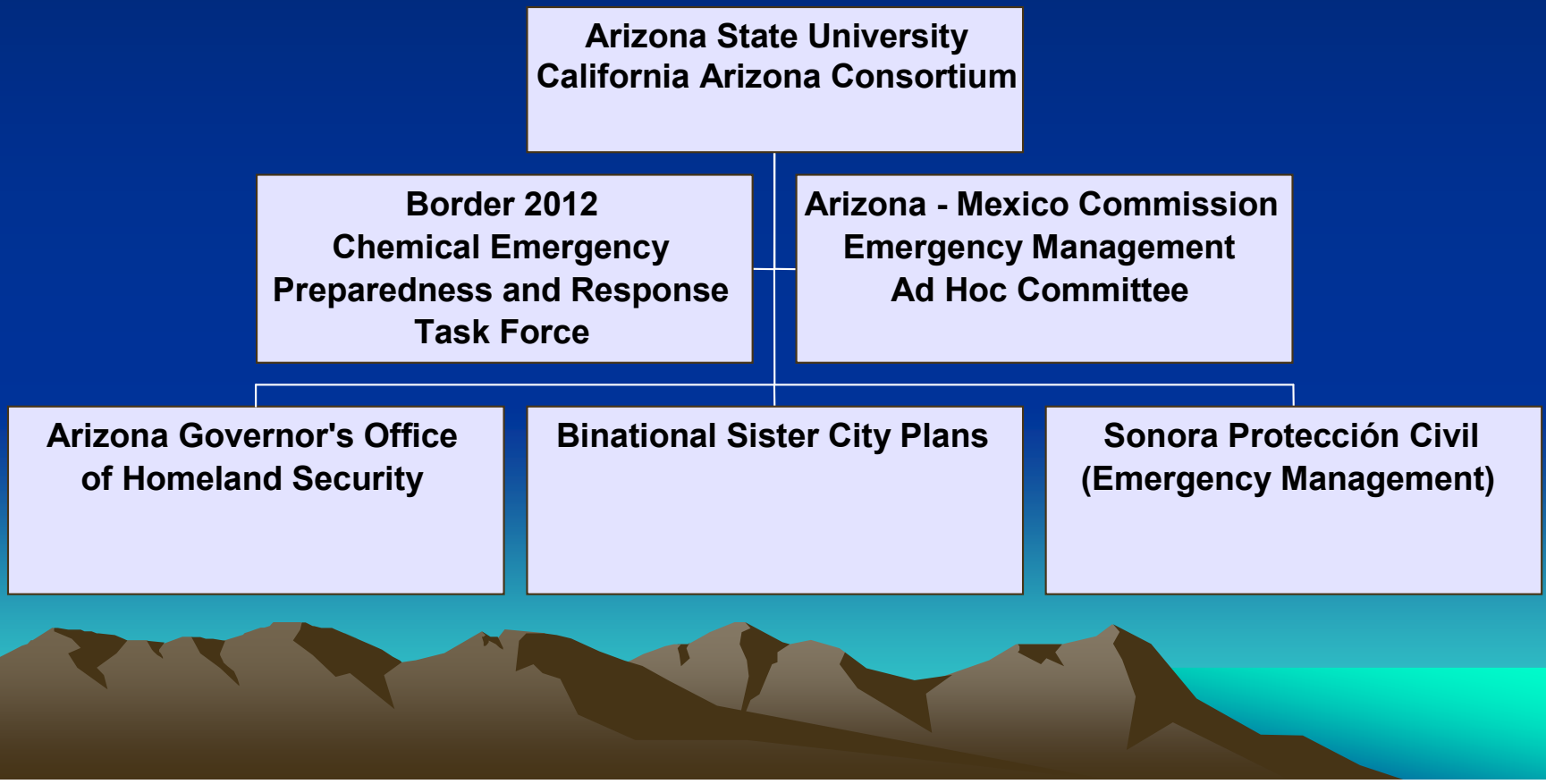
In the event of a disaster of serious proportions that may require a great deal of coordination and cooperation, a plan between the two cities to prevent and respond to disasters will better ensure a full and effective utilization of resources and manpower essential to protect the public health, safety and environment within the border area

# Emergency Management Ad Hoc Committee (AMC)

- Arizona Governor Napolitano and Sonora Governor Bours signed a Declaration of Cooperation addressing:
  - Joint training in hazardous materials, fire fighting and bioterrorism
  - Technical and facility resource exchange
  - Coordination of critical incident response

# CAC 24 Hr. First Responder Technician Level Training

- Nogales, Sonora, Mexico Maquilladora Grupochamberlain – March 2004



# CAC Emergency Response Training Curriculum Modules

## NEW FOCUS

- Paradigm Change in site safety and health planning; and emergency response planning
  - Chemical and Biological Warfare Agents
  - Personal Protection Equipment
  - Instrumentation
- Risk Analysis – Probability factors
  - Site Security Planning
  - Weapons of Mass Destruction (BNICE)

# Chemical Agents

- Nerve
- Blister
- Blood
- Choking

# CHEMICAL & BIOLOGICAL WARFARE AGENTS

## CHEMICAL AGENTS

- NERVE Agents
  - Tabun (GA)
  - Soman (GD)
  - V Agent (VX)
  - Sarin (GB)

# CHEMICAL & BIOLOGICAL WARFARE AGENTS

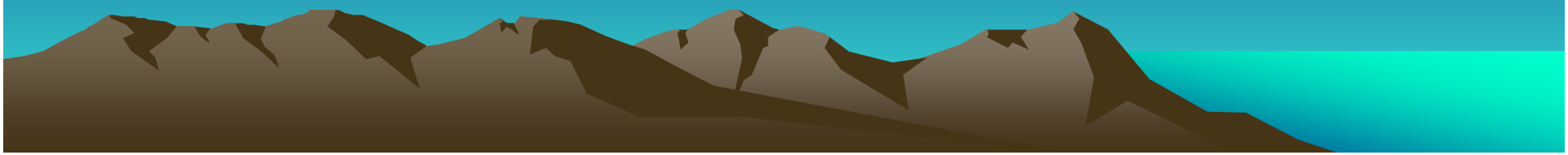
## CHEMICAL AGENTS

- BLISTER Agents
  - Mustard Gas (H)
  - Distilled Mustard (HD)
  - Nitrogen Mustard (HN)
  - Lewsite (L)
  - Phosgene Oxime (CX)

# CHEMICAL & BIOLOGICAL WARFARE AGENTS

## CHEMICAL AGENTS

- **BLOOD Agents**
  - **Hydrogen Cyanide (AC)**
  - **Cyanogen Chloride (CK)**



# CHEMICAL & BIOLOGICAL WARFARE AGENTS

## CHEMICAL AGENTS

- **CHOKING Agents**
  - **$Cl_2$**
  - **Phosgene**

# CHEMICAL & BIOLOGICAL WARFARE AGENTS

## CHEMICAL AGENTS

- **RIOT CONTROL Agents (Irritants)**
  - **Tear Gas (CS or CR)**
  - **Mace (CN)**
  - **Pepper Spray (OC)**
  - **Adamsite (DM)**

# Biological Agents

- Bacteria
- Virus
- Biological Toxins
- Rickettsiae

# CHEMICAL & BIOLOGICAL WARFARE AGENTS

## BIOLOGICAL AGENTS

- **BACTERIA**
  - **Anthrax**
  - **Brucellosis**
  - **Cholera**
  - **Plague**
  - **Tularemia**

# CHEMICAL & BIOLOGICAL WARFARE AGENTS

## BIOLOGICAL AGENTS

- **VIRUSES**
  - **Smallpox**
  - **Venezuelan Equine Encephalitis (VEE)**
  - **Viral Hemorrhagic Fevers (VHF)**

# CHEMICAL & BIOLOGICAL WARFARE AGENTS

## BIOLOGICAL AGENTS

- **RICKETTSIAE**
  - **Q Fever**

# CHEMICAL & BIOLOGICAL WARFARE AGENTS

## BIOLOGICAL AGENTS

- **BIOLOGICAL TOXINS**
  - **Botulinum Toxin (Botulism)**
  - **Ricin**
  - **Saxitoxin**
  - **Staphylococcal Enterotoxin B**
  - **Trichothecene Mycotoxins**

# Weapons of Mass Destruction (BNICE)

- B Biological
- N Nuclear
- I Incendiary
- C Chemical
- E Explosive

# Terrorism Impact on Emergency Management Approach

- Classical planning:
  - Risk = Magnitude x Probability
  - control systems based on the risk
- Terrorism Impact on Emergency Management Planning:
  - Probability Change
  - Risk Change
  - Control focuses on **Site Security**

# IMPACT ON EVALUATING THE RISK OF CHEMICAL RELEASES

- **TWO MAJOR CHANGES SINCE 9/11**
  - **PROBABILITY FACTOR**
  - **Has Changed For Chemicals On Site**
  - **Need to include ASSESSMENT of**
  - **Chemical & Biological Agents which**
  - **can be brought on site**

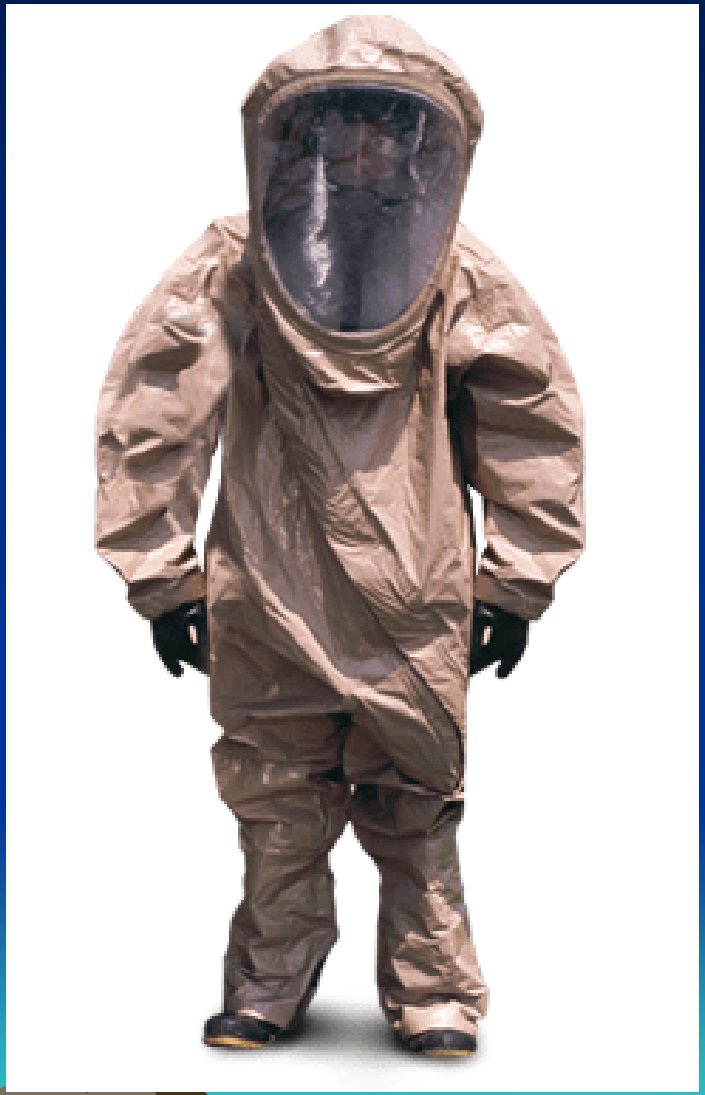
# Personal Protective Equipment

## Suits

### Tychem Responder CSM

**Chemical Test Results for Responder CSM Fabric**

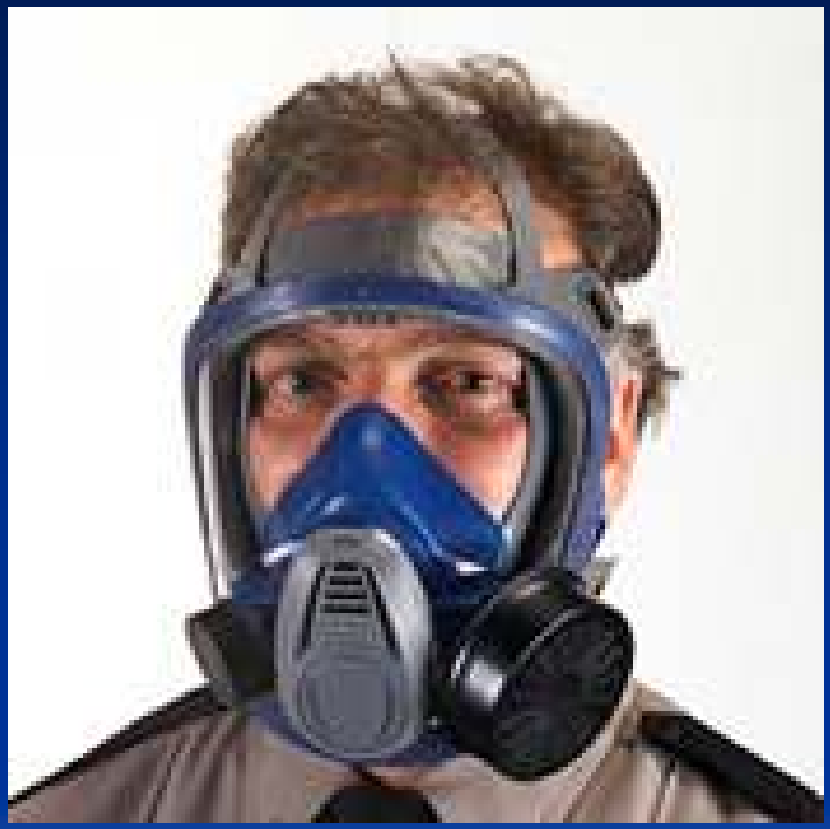
| Chemical Agent | Breakthrough time (minutes) | Breakthrough Criteria ($mg/cm^2$) |
|---|---|---|
| Mustard (HD) | >480 | 4.00 |
| Lewisite (L) | >480 | 4.00 |
| Tabun (GA) | >480 | 1.25 |
| Sarin (GB) | >480 | 1.25 |
| Soman (GD) | >480 | 1.25 |
| Nerve (VX) | >480 | 1.25 |



# Personal Protective Equipment Respirators

MSA

Advantage 1000CBA-RCA

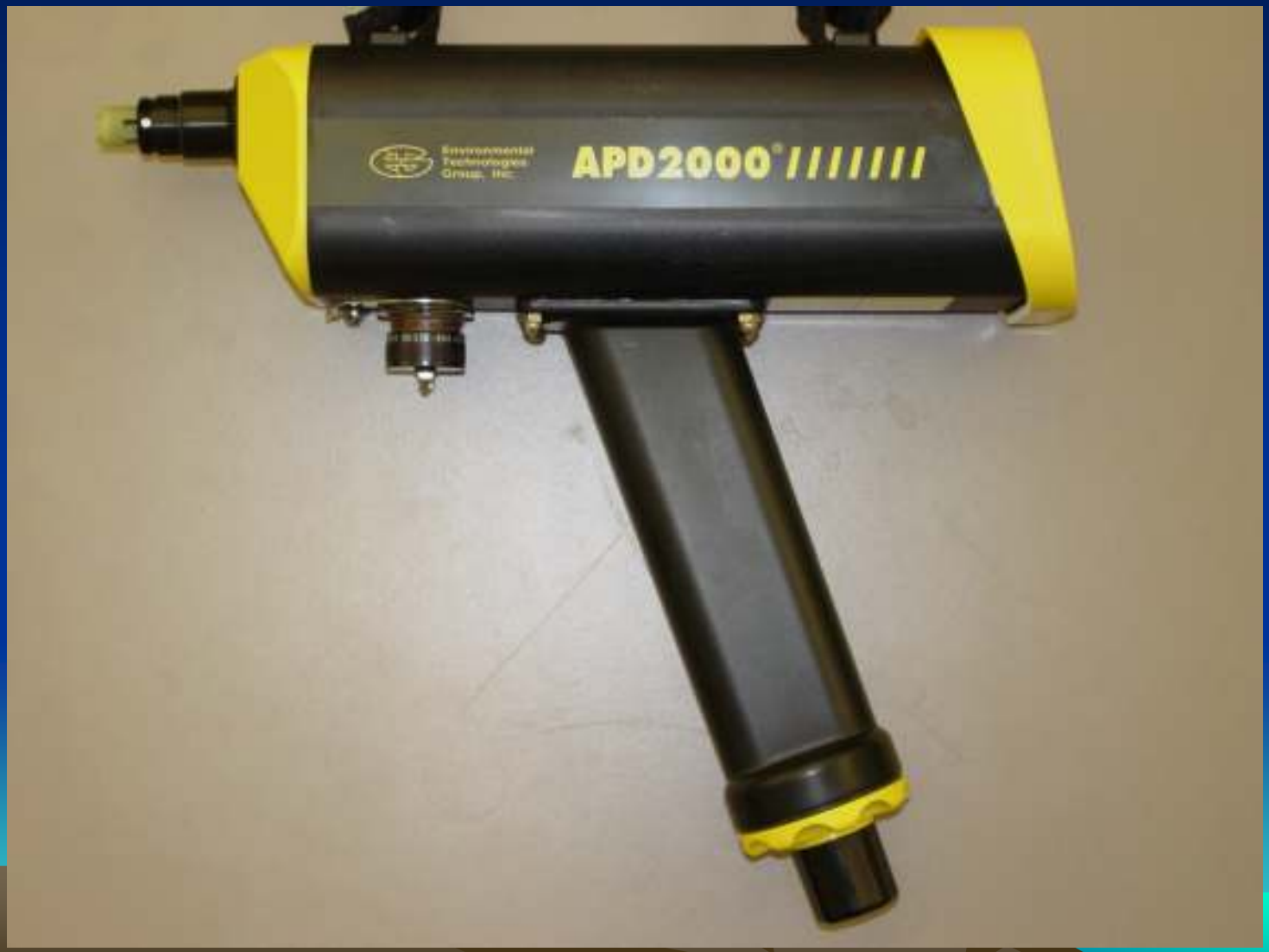


MSA

Advantage 3200CBA-RCA

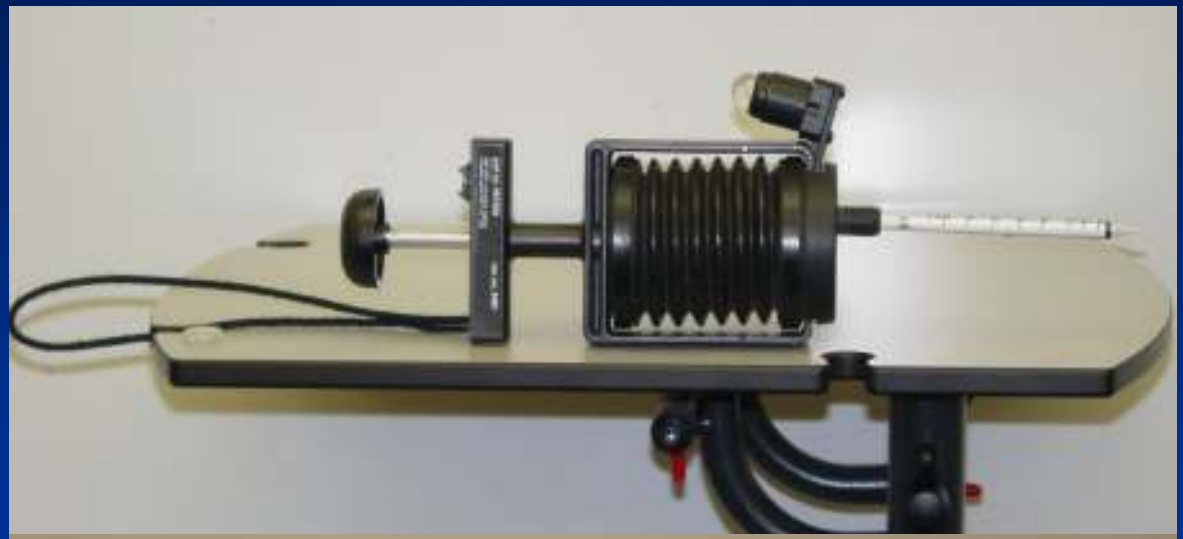
# ADVANCED PORTABLE DETECTOR DETECTOR

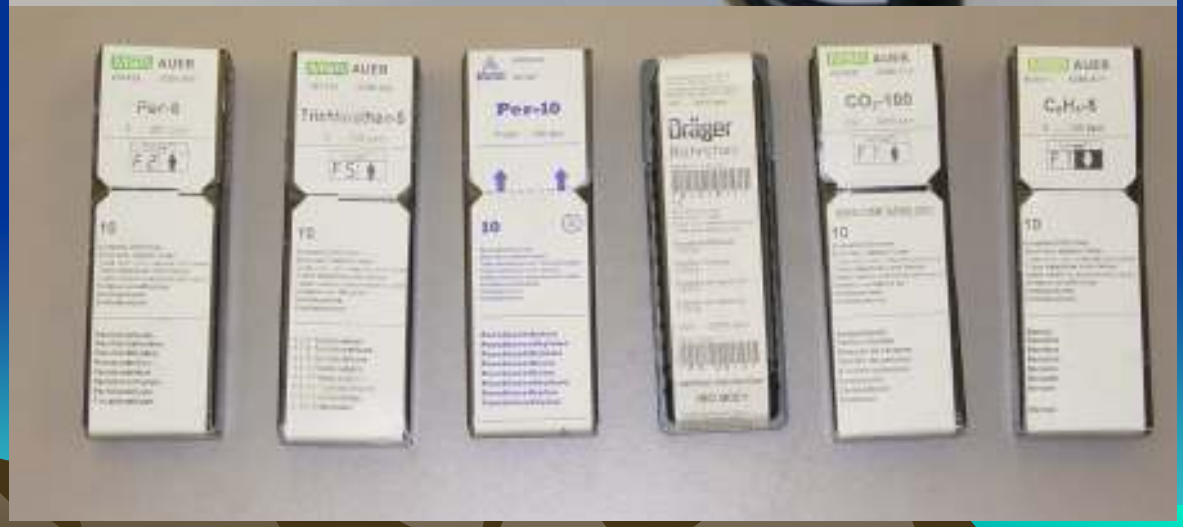
## APD 2000



# COLORIMETRIC TUBES

## Pump

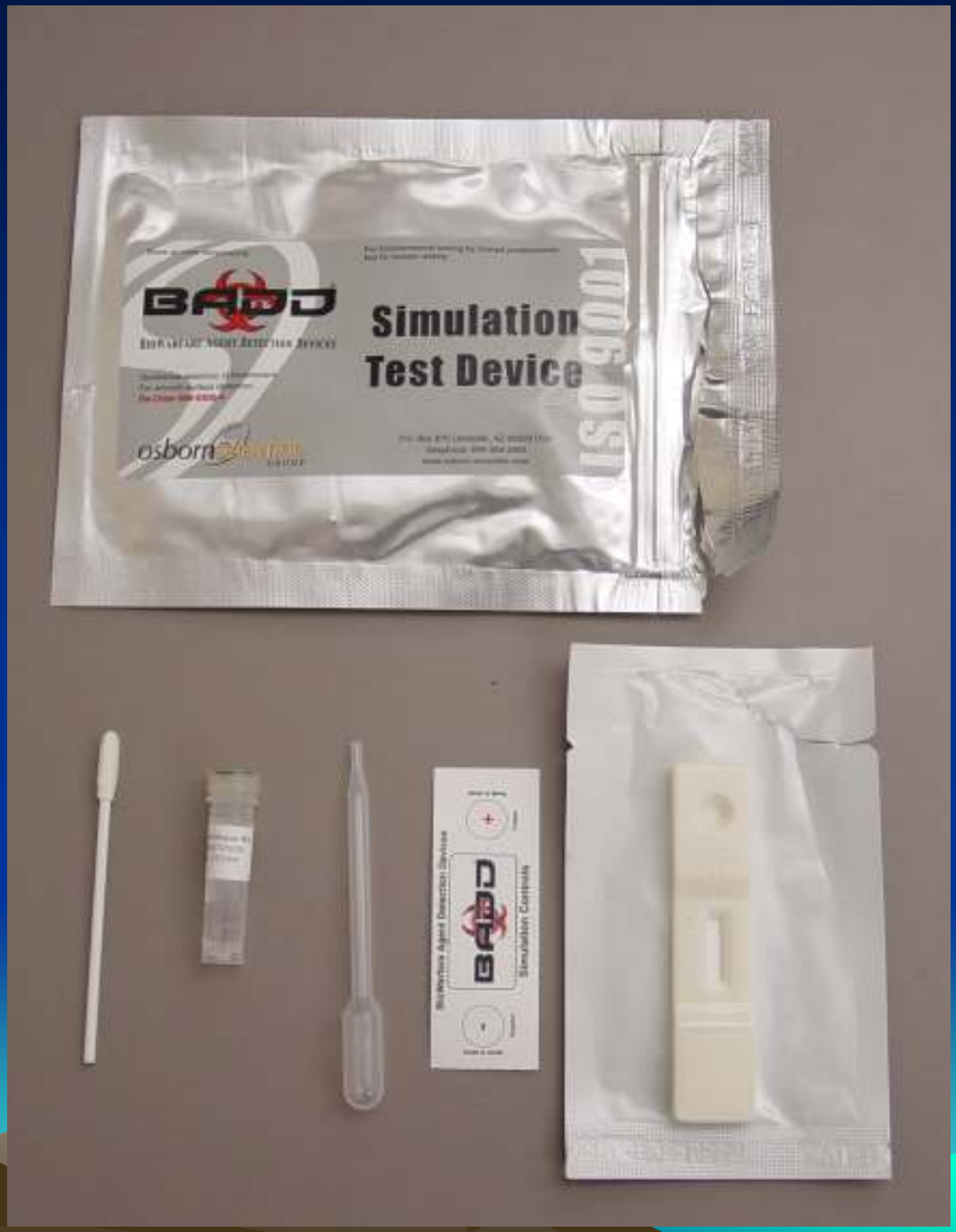




# DETECTOR KITS

## Biological Agents

## Detection Kits



# NEW PARADIGM OF READINESS

- Hazard Assessment
- Control Methods
- Personal Protective Equipment
- Instrumentation / Detection Devices
- National Incident Management System
- Site Security Activities

# Future CAC Training
# Other Sister City Plans

- **San Luis Colorado, Sonora & San Luis, Arizona**
- **Agua Prieta, Sonora & Douglas, Arizona**
- **Naco, Sonora & Cochise County, Arizona**

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